



WIRELESS BROADBAND DEVELOPMENTS IN AUSTRALIA - AN INDUSTRY PERSPECTIVE

Chris Althaus

Australian Mobile Telecommunications Association

Rapid consumer adoption of mobile devices is driving increased data traffic as consumers seek to utilise a range of applications and services, including mobile broadband, emails, videos, social networking, online banking and shopping. This paper explores the rapidly growing demand for latest generation mobile data applications and services, particularly mobile broadband, from a mobile telecommunications industry perspective. Mobile data traffic is forecast to increase at a compound annual growth of 95 per cent to 2014. Mobile telecommunications plays a key productivity-enabling role in the digital economy. Mobile operators must have access to sufficient radiofrequency spectrum and be able to deploy network infrastructure (base stations and towers) efficiently if they are to meet consumer demand. AMTA strongly believes Government policy must encourage continued investment in infrastructure and innovation to ensure that the benefits of mobile broadband and a growing digital economy can be realised by all Australians.

INTRODUCTION

The Australian Mobile Telecommunications Association (AMTA) is the peak industry body representing Australia's mobile telecommunications industry. Its mission is to promote an environmentally, socially and economically responsible, successful and sustainable mobile telecommunications industry in Australia.

AMTA's membership is made up of firms engaged in the mobile telecommunications market with limited involvement in fixed wireless services. AMTA's members include the mobile carriage service providers (CSPs), handset manufacturers, retail outlets, network equipment suppliers and other suppliers to the industry. For more details about AMTA, see <http://www.amta.org.au>

This paper's purpose is to explore the rapidly growing demand for latest generation mobile data applications and services, particularly mobile broadband (MBB) from a mobile telecommunications industry perspective.

The paper considers the evolution of demand for mobile broadband (MBB) and smartphones in Australian and global contexts, and identifies economic and social impacts of these trends before focussing on critical mobile telecommunication infrastructure issues.

Clearly, mobile telecommunications are increasingly at the centre of people's lives, providing mobility, connectivity and productivity benefits. Reflecting this growing impact and influence, mobile telecommunications is gravitating towards the centre of economic and social policy in Australia and globally.

Rapid consumer adoption of mobile devices is driving increased data traffic as consumers seek to utilise a smorgasbord of applications and services including mobile broadband, emails, videos, social networking, online banking/shopping and, of course, telephony.

The convergent era is being dominated by ‘anytime/anywhere’ connectivity which is not only revolutionising the way Australians go about their daily lives, but bringing about profound changes and challenges to market structures, business models and policy frameworks.

GROWTH IN DEMAND FOR MOBILE SERVICES

The myriad forecasts, which all point to the same spectacular scenario of smartphone proliferation and rapid growth in mobile data traffic, can be juxtaposed to the evolutionary path of mobiles in Australia, giving a perspective of where the industry has been as it embarks on the next phase of its growth.

Figure 1 traces the evolution of mobiles in Australia: it started 24 years ago with a big and bulky “brick” weighing more than half a kilogram and offered voice-only services and they cost more than \$4000 each. In the ensuing two-and-a-half decades there has been a rapid evolution in technology to what we have today – digital, slim-line, pocket-sized, hand-held mini-computers that provide an array of mobile data services, such as web browsing, email, video, chat, social networking and GPS navigation, which can be accessed on smartphones.

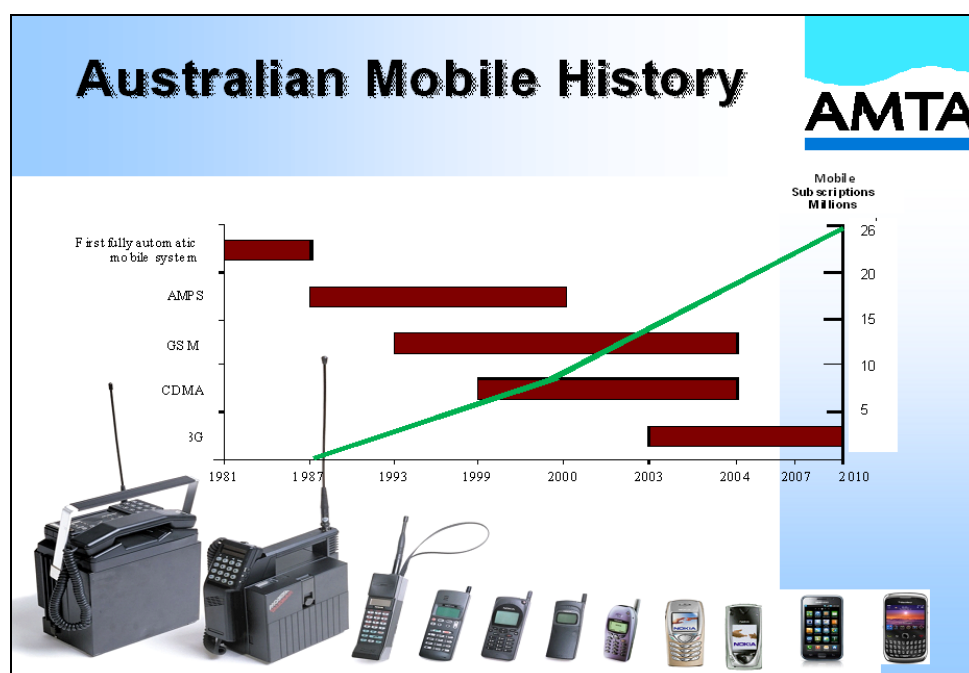


Figure 1 - History of mobile phones in Australia: the 25-year evolution of mobiles from bulky “bricks” to slimline mini-computers promoting mobility, connectivity and productivity.

The key metrics in the Australian market are:

- 26 million mobile subscriptions services in Australia – to June 30 2010 – ACMA
- Market penetration of around 115% with population of 22+million people
- Mobile broadband subscriptions increased 71% to reach around 3.46 million as at 30 June 2010

GLOBAL GROWTH IN DEMAND FOR MOBILE SERVICES

Just as mobile subscription growth has eclipsed other aspects of the ICT environment – so mobile broadband has grown very strongly in the past 10-15 years and followed a similar trend level as shown in Figure 2.

The International Telecommunications Union (ITU) has recognised that demand for mobile broadband services is growing exponentially and this is driving exponential growth in mobile data traffic on networks.

"Even during an economic crisis, we have seen no drop in the demand for communications services," ITU Secretary-General Hamadoun Toure said in a statement at the 2011 Mobile World Congress in Barcelona, Spain.

Globally, the ITU predicts that the ranks of mobile phone subscribers will swell to five billion people in 2011. The ITU also suggests the number of mobile broadband subscriptions would exceed one billion this year and is forecast to reach 5 billion by 2016.

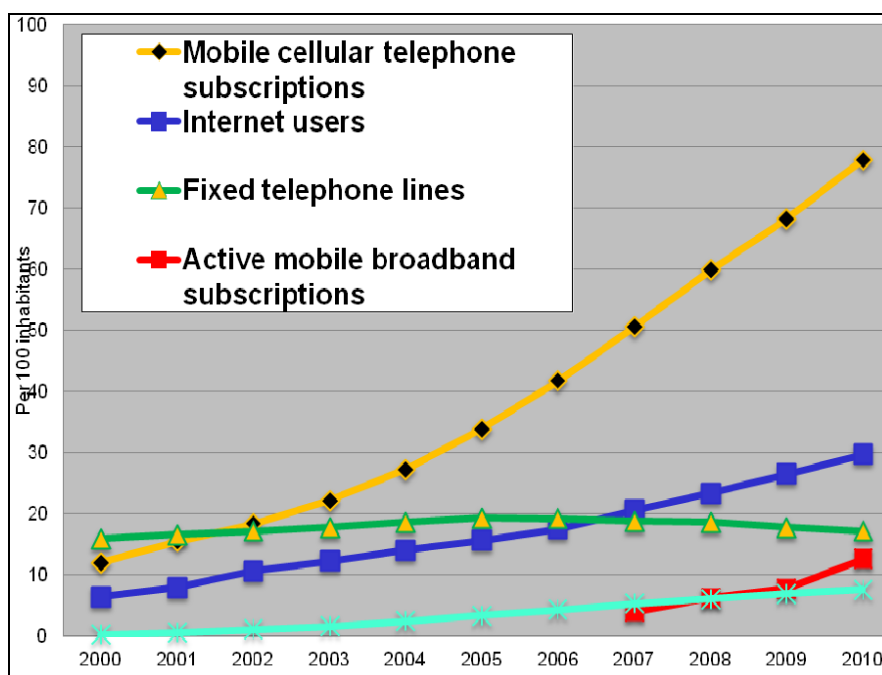


Figure 2 - Global ICT developments 2000-2010 (IT World Telecommunication ICT Indicators).

SMARTPHONE DEMAND

This year has been marked by the continued rise of mobile broadband (MBB) and the smartphone in the Australian market, which one media organisation headlined: "Australia's white hot smartphone revolution". This so-called revolution is being driven by new and competitive mobile broadband technologies, applications and services, which, in turn, drive productivity via the digital economy and meet the connectivity needs of Australians.

The Sydney Morning Herald article quoted a Google survey that found Australia was second only to Singapore in a measure of worldwide smartphone penetration and, according to the research, Australians, on average, consumed 25 mobile applications on their phone compared to 23 for the United States and Britain.

Google's mobile product marketing manager for the Asia-Pacific region, Ryan Hayward, said: "The rise of smartphones is dramatically increasing the use of the Internet overall in Australia and ...we are seeing mobile usage and smartphones usage starting to approach or even match PC usage." (Moses 2011)

The rapid take-up of smartphones and MBB access in the Australian market is further underlined in a Telstra survey undertaken in mid-2011. Telstra's 2011 Smartphone Index found that 46 per cent of Australian mobile phone users now use Internet-connected smartphones, which rose from 31 per cent last year and is expected to grow to more than 60 per cent over the next 12 months.

The survey found that 51 per cent of male mobile phone users had a smartphone compared 42 per cent of females and smartphones are not just for Gen Ys with almost a quarter (23 per cent) of smartphone users over 50 and 39 per cent are over 40.

The Telstra Smartphone Index 2011 also found that 90 per cent of Australian smartphone owners have accessed the Internet on their mobiles compared to 60 per cent for the total mobile phone population. Email, mobile Internet search and social networking sites are visited most frequently by smartphone users.

Google and Facebook are by far the most popular sites frequently visited, followed by Hotmail, Yahoo (for email) and, interestingly, the Bureau of Meteorology ranks as the fifth most visited site for smartphone users. Sixty-one per cent of smartphone owners are accessing the mobile Internet on their phones daily, which is a rise from 53 per cent in 2010.

Research company, Telsyte, said in October: “Australians love their smartphones with nearly 10 million more to be in use by 2015, taking the total number of smartphone users to 18.5 million.” Telsyte forecast that by 2015 nearly 90 per cent of all mobile phone users would have a smartphone as their primary mobile device, a rise from just under 50 per cent in 2011.

“Over the coming four years Telsyte estimates that more than 30 million smartphones will be sold in Australia creating a vibrant and competitive market for vendors, carriers and retailers,” said Telsyte research director, Foad Fadaghi. ([Telsyte 2011](#))

Earlier this year, the head of Cisco in Australia said this country had a higher uptake from “dumb phones” to smartphones than most other places in the world. ([Cisco 2011](#))

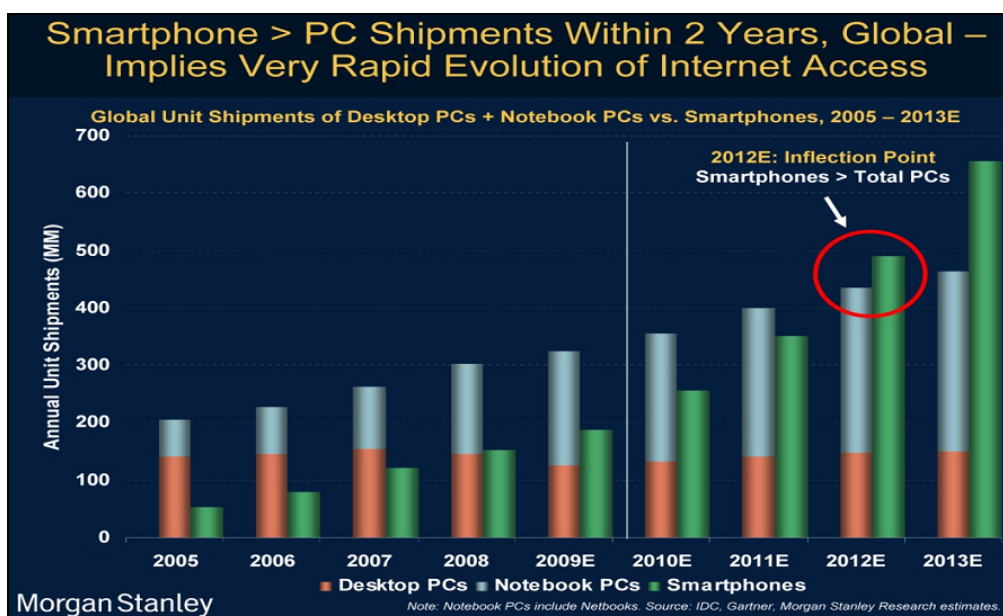


Figure 3 - In a further indication of the global rise of smartphones, Morgan Stanley estimates that within two years from 2010 global shipments of smartphones will exceed PCs and notebooks.

EXPONENTIAL GROWTH IN MOBILE DATA TRAFFIC

The rapid adoption of smartphones translates into strong mobile traffic growth. The leader of the wireless access domain team at Alcatel-Lucent’s Bell Labs research arm, Dr Tod Sizer, said recent studies had shown that a typical smartphone consumes, per month, about 25 times as much wireless data as a phone did five years ago.

“And our conservative expectation of the growth that we are going to see in the next four years is a factor of 30...and a factor of a hundred in the next 10 years,” he said. ([Wilton 2011](#))

Ericsson recently compiled data from measurements made across several years on more than 1000 mobile networks around the world. Ericsson has predicted:

- Global mobile data traffic will increase by 10 times over the next five years

- Global mobile broadband subscriptions to hit 900 million by the end of 2011 and are expected to reach 5 billion by the end of 2016
- Total smartphone traffic will triple in 2011
- Mobile traffic will increase by 60% every year until 2016 and this is mainly driven by increasing demand for video content. ([Ericsson 2011a](#))
- Traffic from advanced smartphones is expected to increase 12-fold over the next five years

Today, the average mobile broadband connection generates 1.3 gigabytes of traffic per month - which is equivalent to about 650 MP3 music files. By 2014, the average mobile broadband connection is projected to generate 7 gigabytes of traffic per month, which is equivalent to about 3,500 MP3 music files.

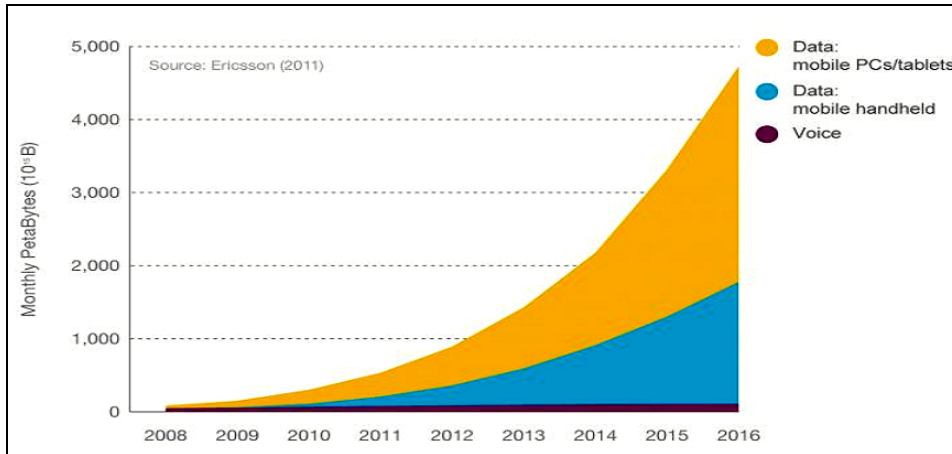


Figure 4 - Global mobile data traffic projection ([Ericsson 2011a](#)): Global mobile data traffic is forecast to follow a trend line that will see an increase in mobile data traffic of over 600% between 2011 and 2015.

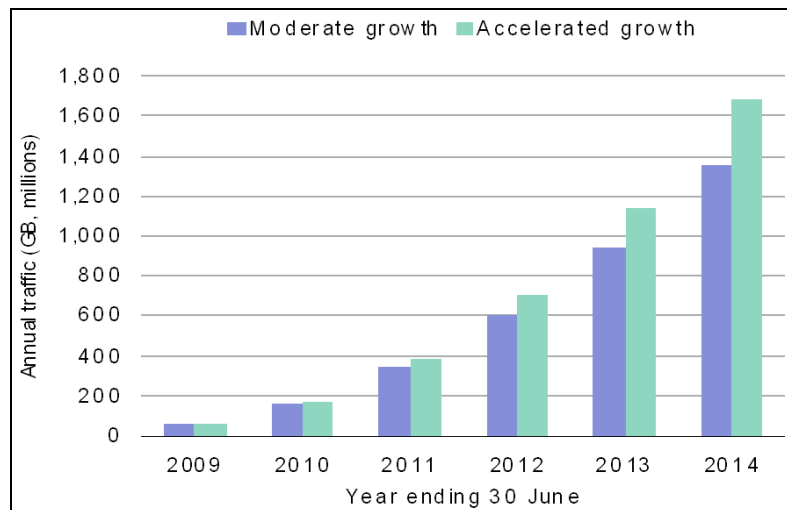


Figure 5 - Mobile broadband annual traffic projections Australia 2009 to 2014. This represents a compound annual growth over the period of 2010-2014 of 87-95% ([Network Strategies 2010](#))

ECONOMIC IMPACT - PRODUCTIVITY

Mobile broadband is widely recognised to be an enabling force in the evolving digital economy both in Australia and globally.

The Australian Communications and Media Authority (ACMA) notes:

There is widespread recognition that mobile broadband services are an economic enabler within society and the provision of these services, technologies and applications in the wider community is in the public interest. ([ACMA 2011](#))

An Access Economics' analysis, commissioned by AMTA, found that mobile telecommunications play a pivotal role in the Australian digital economy because the enabling technology drives productivity and connectivity across all sectors. The sector's flow-on indirect economic impact is greater than its direct impact, unlike other industries.

The report, *Economic Contribution of Mobile Telecommunications in Australia*, found that the mobile telecommunications industry contributed \$17.4 billion to the Australian economy in 2008-09 with the rapid uptake of mobile data services, including mobile broadband, delivering productivity gains across the entire economy. ([Access Economics 2010](#))

The report says that the key productivity-enabling role of mobile technology had a \$10.7 billion indirect flow-on to the wider economy in 2008-09 compared to the industry's direct economic impact of \$6.7 billion.

The Access Economics report found the indirect contribution of \$10.7 billion to Gross Domestic Product (GDP) has grown significantly by \$3 billion, or nearly 40%, over the previous two years as the result of rapid mobile data uptake driving big productivity gains to the Australian economy.

The economic benefits created by the industry are far greater than the resources it draws from the economy," it says. "This contrasts with many other industries, for which the major component of economic contribution derives from the industry's own usage of economic resources. In this regard the mobile phone industry is shown to be 'punching above its weight'."

"Mobile data is an increasingly important component of the industry. Access Economics forecasts suggest that mobile broadband subscribers will grow significantly over the coming years with the total number of mobile broadband subscriptions passing 50% of the population size in 2012," says the Access Economics Report. ([Access Economics 2008](#))

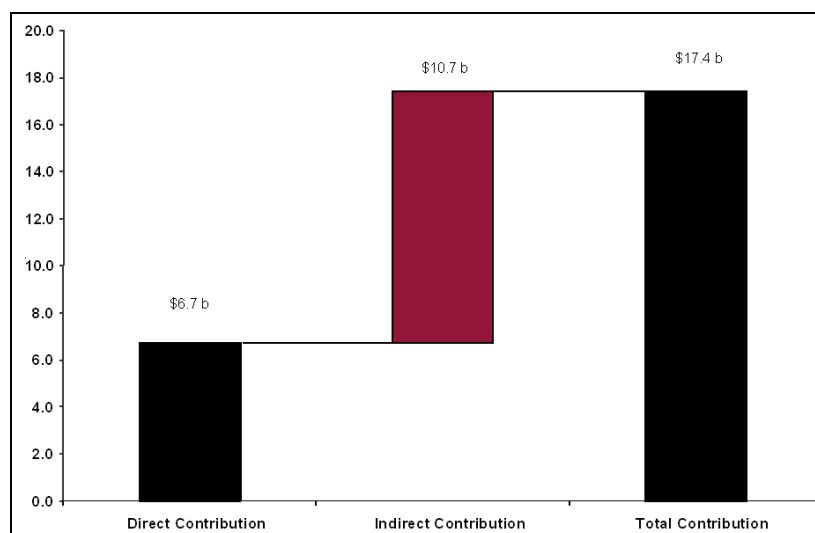


Figure 6 - Economic Contribution of Mobile Telecommunications 2010 (Access Economics 2010)

A second report, *2.5GHz in Australia: The future deployment of mobile broadband services* was undertaken by Network Strategies and examines the links between mobile broadband, productivity and the role of new spectrum in 700MHz (Digital Dividend) and 2.5GHz bands.

“We estimated gross productivity benefits for mobile broadband over the period 2013 to 2020 to be around \$143 billion,” says the report. ([Network Strategies 2010](#)).

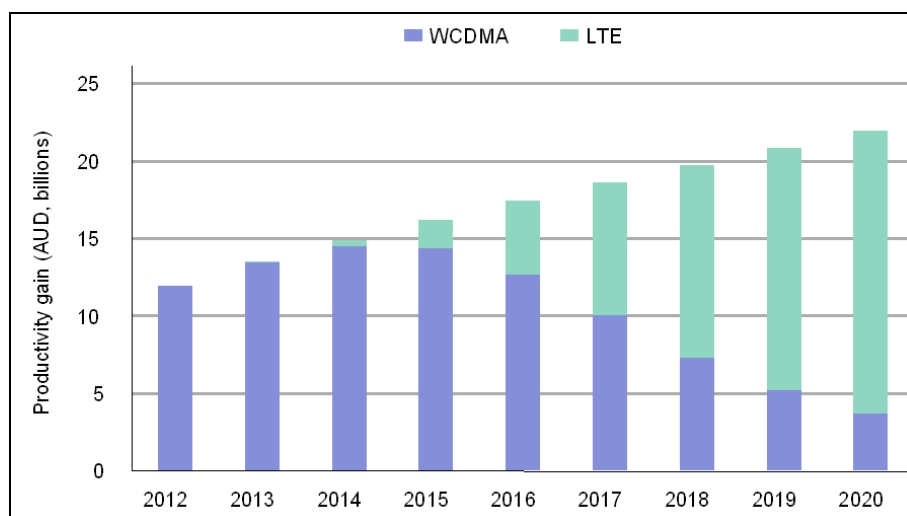


Figure 7 - Estimated productivity benefit from mobile broadband Australia 2012-2020. This assumes the commercial launch of LTE over 2.5GHz in 2013 with 700MHz one year later. ([Network Strategies 2010](#))

Network Strategies estimate that by 2020 there will be almost 20 million mobile broadband subscriptions on handsets together with another 6.3 million datacards (under a moderate growth scenario). The strong growth in mobile traffic would reach 1360 million Gigabytes by 2014.

The Network Strategies report also estimates the gross productivity benefits from the two new spectrum bands - a 700MHz/2.5GHz combination - to be in the region of \$62 billion over the period 2013 to 2020. The report assumes the commercial launch of latest generation networks using Long-Term Evolution (LTE) technology over 2.5GHz occurs in 2013 with LTE over 700MHz available one year later in 2014. ([Network Strategies 2010](#))

It is the flow-on impacts on productivity and connectivity throughout the economy and society that really highlights the central role of mobile telecommunications technology and the services it carries.

A study conducted by Ericsson and Arthur D. Little found that for every 10 percentage point increase in broadband (fixed and mobile) penetration that GDP increases 1 percent. The study also confirmed the correlation between faster broadband speeds and increases to GDP. ([Ericsson 2011b](#))

Research conducted on behalf of the UK telecommunications firm O2 found that mobiles overall increased UK labour productivity by almost 1%. The gains were largest among “mobile workers”, the group of largely blue-collar workers with no fixed work location, including trades people. ([CEBR 2006](#))

Modelling undertaken by Telstra found that in the long term, annual real household consumption will be 1.4% greater than it would be in a scenario without mobile broadband services.

SOCIAL IMPACTS - CONNECTIVITY

Behind the economic success of the mobile telecommunications industry, there are customers who use mobile telecommunications as an important part of their lifestyles and the way they interact with family, friends, work, governments and the community.

To explore social attitudes towards mobile telecommunications, AMTA joined world-leading researchers in a three-year social research project to measure the impact of mobile phones on the balance between work and family life.

AMTA's collaboration with social researchers from the Australian National University, the University of New England and the University of New South Wales was part of an Australian Research Council Linkage Grant and was the first Australian study of its kind.

This project was finished in 2009, which means it had limited exposure to the current mobile data / broadband usage trends, however, the results remain relevant and are still being published in international journals. The latest publication, titled, "Constant Connectivity: Rethinking interruptions at work", was in *Organization Studies* this year. ([Wajcman and Rose 2011](#))

The Impact of the Mobile Phone on Work/Life Balance was the first study in Australia to use nationally representative data on how mobile phones have become integrated into the everyday lives of Australians. ([Wajcman et al 2008](#))

It collected nationally representative data between March and September 2007 from a sample of 2185 individuals, comprising 1905 individuals from 1435 on-line households and 280 individuals in 280 off-line households.

"To date, social research on the mobile phone and other contemporary mobile communication technologies has been limited and has yet to be established into a body of evidence about its social impact," the researchers said. "This project, for the first time in Australia, will empirically examine the social impact of mobile technologies at work and at home. It will, therefore, fill a significant gap in the evidence base for the development of industry and social policy."

AMTA believes an understanding of the social impacts – as well as the economic aspects – will help policy makers, regulators, industry and consumer groups have a more informed debate and lead to effective, informed and practical evidence-based policies.

The study's key findings were:

- More than half of the employed respondents believe that the mobile helps their work-life balance. Very few report that the mobile phone has a negative impact on it. More than half of mobile-owning workers, who have high levels of satisfaction with their family interactions, regard the mobile as having increased their ability to find work-life balance.
- Mobile phone use varies with age but it is so universally diffused that use is unaffected by income levels and occupation. Only 12% of 14 to 17 year olds do not have a mobile. The lowest number of owners (74%) is found among those aged over 60 years.
- Logs of actual calls made and SMS texts sent show that the predominant use of the mobile is for contacting family and friends, with work-related reasons far less important. Men make more calls for business purposes, while women use the mobile for social connectivity.
- Calls cluster by time of day, according to purpose. Most work-related calls are made in standard working hours. The rate of calls to family and friends is higher than work-related calls during working hours and peaks at the end of school hours and in the evening.
- Asynchronous communication practices, such as turning off your mobile to avoid being disturbed, are common techniques. Ninety per cent of the respondents "normally" switch off their phone in the cinema, two-thirds switch off their phone at work meetings, and half turn off their phones in restaurants. Women are more reluctant than men to take their mobile phone on holiday "to talk to work colleagues".

- Four in ten employed respondents think that mobiles increase their workload, for 55% the effect is neutral, and a few (5%) think mobiles reduce their workload. This is offset by productivity gains.
- Conveying information about “timing of the arrival at home” and “arranging to meet with other family members” are the major uses of the mobile phone for micro-coordination.
- The mobile phone is an indispensable part of the everyday life of Australians. About nine in ten people report that their lives could not “proceed as normal” if they were suddenly without their mobile phone.
- Carrying a mobile phone makes most people (75%) feel more secure.
- Contrary to fears about the intrusive character of the mobile phone on leisure, few respondents (5%) report that the mobile reduces the quality of their leisure time.

When considering the connectivity implications of latest generation mobile applications and services, social networking is another stand-out growth area. For example, Facebook has around 800 million users globally and 43% (350 million) access the service on mobile devices, with twice as many actual visits coming via mobile devices rather than desktops.

Facebook expects mobile to be the main source of its next billion users as smartphones become more powerful and the value of adding social tools to devices is realised.

Facebook VP for partnerships and corporate development Vaughan Smith said

“...we think that mobile is much more powerful when you add social. And we think the confluence of those two trends are the most important thing going on in technology over the next ten years.” ([Smith 2011](#))

A Telstra survey, “The Telstra Smartphone Index 2011”, released on July 11, 2011, found that smartphones were replacing PCs as a preferred way to access some content with one in four smartphone surfers visiting social networking sites more on their mobiles than they do on a computer and one in five searching the mobile web more on their phones than on a PC.

This research was conducted by Nielsen on behalf of Telstra on a representative sample of 2,827 Australians aged over 16 from across Australia in both metropolitan and regional areas. ([Nielsen 2011](#))

A Telstra spokesperson said:

“It’s clear smartphones are becoming an inseparable part of our lives, with Telstra’s research indicating they now help us to shop smarter, connect with our social networks and kill boredom during business meetings.”

“Interestingly while men love to visit app stores and browse news and sports sites, women prefer to spend their time connecting with friends with half saying they check social network sites daily – compared with just a third of men.

“It’s also clear we love our apps. Almost one in four smartphone web-surfers have downloaded more than 20 free apps. Social network apps and games are rated ‘most useful’ followed by weather, transport, maps, banking and health-related apps.”

The Telstra Smartphone Index 2011 found:

- **Mobile social networking surge:** Four in ten smartphone web-surfers now access social networking sites such as Facebook® or Telstra’s Tribe® service every day – sharply up from 31 per cent in 2010.
- **Smartphones making us savvier shoppers:** Almost half of smartphone web-surfers have used their phones to find out more about a product or service before making a purchase. Almost a quarter have actually used their phones to price check while on the shop floor.

- **That's awkward:** Four in ten say they have used their smartphone to avoid a social encounter – with 12 per cent admitting they were merely pretending to use their gadget.
- **Boredom busters:** Almost one in four smartphone surfers admit they're killing boredom when they use their device during a business meeting.
- **Men vs women:** Men are bigger smartphone fans with 51 per cent of mobile-using males owning a smartphone vs. 42 per cent of females.
- **Smartphones firm bed buddies:** 56 per cent of smartphone owners admit to using their smartphone in bed – up from 51 per cent the year before. Once again women are most likely to surf between the sheets (54 per cent versus 49 per cent of men).
- **Smartphones still don't make us smart drivers:** Alarming 17 per cent of motorists admit to illegally surfing the mobile Internet on their phones while driving.
- **Smartphones are not just for tech-savvy Generation Y.** More than one in five Aussie smartphone owners are aged over 50 years, and 39 per cent are more than 40 years.
- **Throne-surfing remains popular:** A third of Aussie smartphone web users have surfed the mobile web while on the toilet. Men are more avid loo-surfers (35 per cent have throne-surfed versus 30 per cent of women).

INFRASTRUCTURE CHALLENGES AND OPPORTUNITIES

For mobile network operators the current and forecast growth in consumer demand for smartphones, mobile broadband and mobile data has created significant and urgent focus on the infrastructure, investments and innovations needed to provide the platform for a rich mobile experience for all users of mobile telecommunications.

Key infrastructure investments include radiofrequency spectrum and the physical infrastructure of mobile networks (base stations and towers).

RADIOFREQUENCY SPECTRUM

Radiofrequency spectrum – the invisible radio waves that carry mobile telecommunication signals is the most basic mobile telecommunications infrastructure on which mobile networks are based.

Australia, along with the rest of the world, is facing a significant challenge to provide additional spectrum resources in response to demand for mobile broadband, which is a key driver of current and future allocations of spectrum resources.

The partnership between spectrum and mobile networks defines the capacity and service performance limits available to users.

As is the case around the world, there is a significant risk that Australian networks will face congestion and degradation of service levels that will impact on all users of mobile networks if additional spectrum resources are not made available in a timely fashion.

Reflecting the global nature of this challenge the Chairman of the US Federal Communications Commission (FCC) recently made the following comments:

“Every day we delay freeing up new spectrum is a day with real costs to consumers, our economy, our global competitiveness, and our future. We have an incredibly bright mobile future ahead of us, if we seize it.”([Genachowski 2011a](#))

“Multiple expert sources expect that by 2014, demand for mobile broadband and the spectrum to fuel it, will be 35 times the level it was in 2009. Cisco has projected a nearly 60X increase between 2009 and 2015. This compares to spectrum coming on

line for mobile broadband that represents less than a 3X increase in capacity. The looming spectrum shortage is real....”(Genachowski 2011b)

Recent work done by the Analysis Group in the United States suggests:

Mobile broadband is critical to the U.S. communications infrastructure and our future economy. Private sector investment, with substantial job creation benefits, can be facilitated by the reassignment of spectrum to mobile broadband. Building on previous studies, we estimate that the reassignment of 300 MHz of spectrum to mobile broadband within five years will spur \$75 billion in new capital spending, creating more than 300,000 jobs and \$230 billion in additional Gross Domestic Product (GDP). The release of an additional 200 MHz of new spectrum after five years will create an additional 200,000 jobs and increase GDP by an additional \$155 billion.

A more extensive and robust mobile broadband network will generate considerable spillover effects as firms create new and innovative products and services. The sooner that spectrum is reassigned to mobile broadband the sooner investment capital will be deployed. A delay in the reassignment will mean a delay in private sector investment and job creation. (Sosa & van Audenrode 2011)

While these comments reflect USA-based analyses the trend for spectrum demand and urgency surrounding future spectrum allocations for mobile broadband is similarly reflected in the Australian context.

A 2011 analysis by the ACMA concluded that Australia’s need for additional spectrum for advanced mobile applications and services would amount to 300MHz by 2020. AMTA believes this estimate to be conservative, however, it does convey the scale of spectrum re-allocation being considered for our local market. (ACMA 2011)

Against this background AMTA sees the allocation of the Digital Dividend (700MHz) and 2.5 GHz bands as a high priority as these resources will have a major role in augmenting existing infrastructure capacity to support the deployment of latest generation mobile services in response to consumer demand for services such as mobile broadband.

Industry requires certainty around processes, timeframes and availability of this critical infrastructure to underpin decisions on investments in future networks, technologies and latest generation mobile applications and services.

AMTA also sees the reissue of existing 15-year spectrum licences as a high priority policy outcome. Given that licences start expiring in June 2013, AMTA notes the challenge faced by industry operators in planning future investments in new spectrum resources (700 MHz and 2.5 GHz) and the urgent need for resolution of licence arrangements for existing spectrum holdings.

AMTA is committed to developing a closer working relationship between the ACMA, the Department of Broadband, Communications and the Digital Economy and other central agencies to develop a co-ordinated and comprehensive strategy on how Australia will meet future demand for mobile broadband services. Such an approach will provide greater certainty and transparency for both Government and industry.

NETWORK INVESTMENTS

The key infrastructure enabler for the mobile network is radiofrequency spectrum availability. In fact, the limitations of spectrum availability mean that mobile network operators must be able to make their networks more spectrally efficient while also expanding capacity to meet the demands created by consumers and businesses who are seeking the benefits of next generation advanced mobile technologies such as mobile broadband. In practice, this means the mobile network operators must be able to increase the number of cells in their networks and make many cells smaller.

Mobile telecommunication networks are radio cellular networks. That is, a base station provides radio coverage to a geographic area known as a cell. Cells are aligned next to each other in a similar pattern to a honeycomb. The location of the base station within the cell is determined by a number of factors, including topography and other physical constraints such as trees and buildings, the cell capacity or expected traffic for the cell and the radio frequency at which the base station will operate.

Each base station has a finite capacity regarding the traffic it can carry and in areas of high mobile use, such as central business districts and high density urban areas, more base stations are required to handle higher levels of traffic. Sometimes quite small cells, known as microcells, are used to cover small geographic areas especially where there is a high traffic demand.

Strong demand for mobile broadband means increasing data traffic, which in turn means that mobile network operators are working to increase the number of cells and microcells.

Increasing traffic volumes mean that mobile network operators must be able to roll out new and upgraded sites and facilities to keep pace with consumer demand as well as the latest generation innovations in technology, such as the transition from 3G to 4G network architecture.

Should mobile network operators be prevented from deploying the necessary infrastructure, the quality of service expectations of customers may not be met which would cause considerable angst to customers, industry and Government alike.

Australian mobile networks now include facilities at more than 18,000 sites in Australia with approximately 3000 new facilities in the feasibility, planning or acquisition stage at any one time.

AMTA believes that the existing regulatory regime is complex but is working effectively to strike a balance between the mobile network operators' need for regulatory certainty in order to plan infrastructure investments to meet demand and the interests of, and consultation with, communities across Australia.

COMMUNITY CONCERNS

Concerned communities often cite health issues for their opposition to the placement of base stations in their neighbourhoods. The carriers comply with strict science-based safety standards containing large safety margins, which are recognised by national and international health agencies including the World Health Organization. The WHO says:

“Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that weak RF signals from base stations and wireless networks cause adverse health effects.” ([WHO 2011](#))

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) says levels of radio frequency electromagnetic emissions from base stations are sometimes thousands of times below safety limits:

“Levels of RF EME from mobile phone base stations are well below the limits specified by the Australian Communications and Media Authority (ACMA). In fact, surveys conducted by ARPANSA have found typical exposure levels from mobile phone base stations to be hundreds and sometimes thousands of times below the regulated limit”. ([ARPANSA 2011](#))

CONCLUSION

The Australian mobile telecommunications industry is experiencing unprecedented demand for mobile broadband and data services facilitated by the rise of smartphones and other devices such as tablets. This has been described in the popular press as Australia's "white hot smartphone revolution".

Notwithstanding media hyperbole, all revolutions are characterised by the speed of change and the large numbers of people affected. Using these two criteria it is not far-fetched to liken the uptake of Internet-connected smartphones, mobile broadband and data use as "revolutionary".

It is predicted that by 2020 Australia will have almost 20 million mobile broadband subscriptions on handsets together with another 6.3 million data cards. The corresponding mobile data traffic volumes are forecast to increase at a compound annual growth rate of 95 per cent to 2014.

The key productivity-enabling role of mobile technology has an indirect flow-on effect on the wider economy that is greater than its direct impact. This means the economic benefits created by mobile telecommunications are far greater than the resources it draws from the economy, which contrasts with many other industries whose major component of economic contribution derives from the industry's own economic resources.

Australia cannot sustain strong economic growth unless it lifts its productive capacity and it cannot sustain ongoing improvements in living standards unless productivity growth improves. One of the key enablers of productivity is mobile telecommunications.

The growth of mobile broadband is widely recognised as central and an increasingly influential component of our evolving digital economy with significant capability to contribute to economic productivity and social connectivity.

There is widespread recognition that mobile broadband services are an economic enabler within society and the provision of these services, technologies and applications in the wider community is in the public interest. ([ACMA 2011](#))

For mobile network operators the current and forecast growth in consumer demand for smartphones, mobile broadband and mobile data has created significant and urgent focus on the infrastructure, investments and innovations needed to provide the platform for a rich mobile experience for all users or mobile telecommunications.

Central to meeting demand for advanced mobile services, including mobile broadband, is access to sufficient radiofrequency spectrum in appropriate bands and the efficient deployment of mobile network infrastructure (base stations and towers).

AMTA strongly believes that continued investment in infrastructure and innovation must be encouraged and fostered by the Government's policy and regulatory framework so that the benefits of mobile broadband and a growing digital economy can be realised by all Australians.

REFERENCES

- Access Economics.2008. "*Australian Mobile Telecommunications Industry: Economic Significance and Contribution*". June 2008. (iv) . Available from:
<http://www.amta.org.au/pages/State.of.the.Industry.Reports>
- Access Economics.2010. "*Economic Contribution of Mobile Telecommunications in Australia*". June 2010. . Available from:
<http://www.amta.org.au/pages/State.of.the.Industry.Reports>

- Australian Communications and Media Authority. 2011. "Towards 2020—Future spectrum requirements for mobile broadband" May 2011 Available at http://agencysearch.australia.gov.au/search/search.cgi?collection=agencies&form=simple&profile=acma&query=towards+2020&scope_disable=off
- Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). 2011. "What about base stations and telecommunications towers - are there any health effects?" *Fact Sheet, EME Series No. 9*. 15 July 2011, Available at: <http://www.arpansa.gov.au/pubs/eme/fact9.pdf>
- Centre for Economic Business Research. 2006. *An analysis of how mobile phone use contributes to business productivity, Report to O₂*.
- Cisco. 2011. *Cisco Visual Networking Index: Forecast and Methodology, 2010-2015*. Available at: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360_ns827_Networking_Solutions_White_Paper.html
- Ericsson. 2011a. "Ericsson predicts Mobile Data Traffic to grow 10-fold by 2016" [Internet]. Released online 7 November 2011. Available from: <http://www.ericsson.com/news/1561267>
- Ericsson. 2011b. "New study quantifies the impact of broadband speed on GDP 27" September 2011 Available at <http://www.ericsson.com/thecompany/press/releases/2011/09/1550083>
- Genachowski, J. 2011a. "Remarks on Spectrum" 6 April 2011. Available at: <http://www.fcc.gov/document/chairman-discusses-spectrum-needs-white-house-remarks>
- Genachowski, J. 2011b. "The Clock is Ticking" 16 March 2011. Available at: <http://www.fcc.gov/document/genachowski-broadband-clock-ticking>
- Moses, Asher. 2011. "Australia's white hot smartphone revolution". [Internet] *Sydney Morning Herald*. Released online 8 September 2011. Available from: <http://www.smh.com.au/digital-life/mobiles/australias-white-hot-smartphone-revolution-20110908-1jz3k.html>
- Network Strategies. 2010. "The future deployment of mobile broadband services 2.5GHz in Australia" Network Strategies Report Number 29028. 15 June 2010. Available at <http://www.amta.org.au/pages/State.of.the.Industry.Reports>
- Nielson, 2011. Telstra Smartphone Index 2011. Available at: <http://www.telstra.com.au/abouttelstra/media-centre/announcements/australias-growing-fascination-with-smartphones-edging-out-pcs.xml>
- Smith, Vaughn. 2011. "Facebook's next billion users to be driven by mobile". *Mobile Business Briefing* 16 November 2011 Available from: <http://www.mobilebusinessbriefing.com/articles/facebooks-next-billion-users-to-be-driven-by-mobile/19477/>
- Sosa, D; van Audenrode, M.; 2011. "Private Sector Investment and Employment Impacts of Reassigning Spectrum to Mobile Broadband in the United States" August 2011 Available at: <http://www.mobilefuture.org/page/-/spectrum-impact-study.pdf>
- Telsyte. 2011. "Ten million more Australians to use smartphones by 2015" [Internet] Released online 21 October 2011. Available from: <http://www.telsyte.com.au/?p=1140>
- Wajcman, J. and Rose, E. 2011. "Constant Connectivity: Rethinking interruptions at work". *Organization Studies* 32 (7): 941-962.
- Wajcman, J; Bittman, M; Johnstone, L; Brown, J; Jones, P. 2008. "The Impact of the Mobile Phone on Work/Life Balance, Final Survey Report" (March 2008)

Wilton, Petroc. 2011. "Bell Labs wireless leader: how to solve Australia's looming mobile data" *Communications Day 2* November 2011 Page 3

World Health Organization (WHO). 2011. "Electromagnetic fields and public health: mobile phones". *Fact sheet N°193* .June 2011. Available at:
<http://www.who.int/mediacentre/factsheets/fs193/en/index.html>

Cite this article as: Althaus, Chris. 2012. 'Wireless broadband developments in Australia - an industry perspective'. *Telecommunications Journal of Australia* 62 (1): 10.1-10.15. Available from: <http://tja.org.au>.